Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band	)	**WT Docket No. 07-293**
	)	
Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band	)	**IB Docket No. 95-91** **GEN Docket No. 90-357** **RM-8610**

To: The Commission

PETITION FOR CLARIFICATION OR PARTIAL RECONSIDERATION

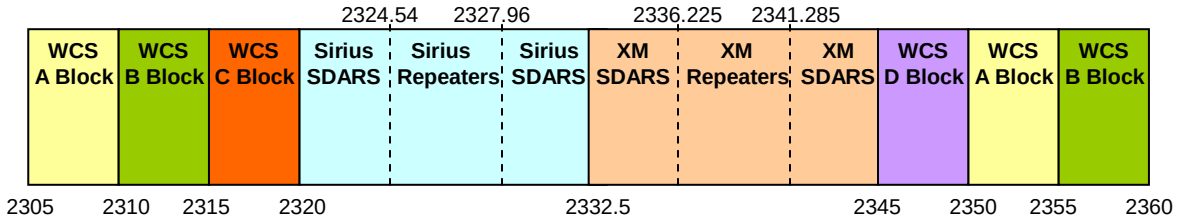
ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.429 of the Commission's rules (47 C.F.R. §1.429), hereby respectfully requests that the Commission clarify, or partially reconsider a single aspect of its *Report and Order and Second Report and Order*, FCC 10-82, 75 Fed. Reg. 45058, released May 20, 2010 (the R&O) in the captioned proceeding.[1] Specifically, ARRL requests that the Commission clarify (1) that Section 2.102(f) of the Commission's rules applies to Wireless Communications Service (WCS) fixed and mobile operations, so that harmful interference that is caused to Amateur Radio Service operations in the 2300-2305 MHz band is to be remedied by WCS licensees; and (2) that the current out-of-band emission (OOBE) limits for WCS devices set forth at Section 27.53(a)(3) of the Commission's rules continue to apply to mobile, portable and fixed facilities across the *entirety of the 2300-2305 MHz band* following the rule changes implemented in this Order. If those clarifications

[1] The R&O was published in the Federal Register on August 2, 2010. Therefore, this Petition is timely filed.

cannot be made, ARRL respectfully requests that the Commission reconsider this portion of the R&O. As good cause for its Petition, ARRL states as follows:

1. The R&O amends the technical rules (47 C.F.R. Part 27) governing the WCS in the 2.3 GHz band, so as to delete the effective limitations on WCS terrestrial operations to fixed services, and to enable licensees to provide mobile broadband services in 25 megahertz of the WCS band. The Commission claims that these technical rules can be changed without risking harmful interference to neighboring operations, specifically claiming to protect adjacent satellite radio, aeronautical mobile telemetry, and deep space network operations. ARRL has no concern with this action (and had no cause to participate earlier in this proceeding), except that noticeably absent from the listed group of interference-protected services following these rule changes is the Amateur Radio Service.

2. The Amateur Radio Service has a secondary allocation at 2300-2310 MHz. The 2305-2310 MHz segment of this allocation overlaps the lower portion of WCS Channel Block A:



Virtually no recognition was given in the R&O of the Amateur secondary allocation at 2305-2310 MHz. Amateur operations *in that segment* are not protected from interference from WCS facilities, however, so there is little to be said about the effect of the R&O on Amateur operations in that segment. However, the lower portion of the Amateur allocation, 2300-2305 MHz, though secondary as well, is secondary to no other radio service. The band is regularly and substantially

utilized by radio Amateurs for narrowband (i.e. 3 kilohertz bandwidth emissions or less) long-distance propagation communications using exceptionally weak received signal levels, most especially around 2304 MHz. This type of operation has proven over time to be completely compatible with deep-space research and other operations below 2300 MHz, and the ambient noise levels in the 2300-2305 MHz band are historically very low, making the band attractive for Amateur weak-signal communications, the principal Amateur use. WCS fixed operations, though at high power, have not proven a significant noise source in the past at 2300-2305 MHz. This is due perhaps to the relative absence of such facilities. However, it must be assumed (1) that mobile broadband devices will proliferate at and above 2305 MHz following the R&O; and (2) that they will be operated in close geographic proximity to Amateur stations operating in the 2300-2305 MHz band.

3. The R&O conceded this, but in essence dismissed any concern about interference to Amateur operations in the 2300-2305 MHz band. The Commission stated at Footnote 405 of the R&O that OOBE from WCS, when expanded to permit mobile broadband and portable devices at up to 250 mW EIRP, will have an effect on Amateur operations in that band:

> We note that some amateur stations operating around 2304 MHz may experience an increased antenna noise temperature caused by the implementation of mobile WCS operations, and will have to tolerate this change in the RF environment. Due to the technical flexibility allowed to amateur stations in Part 97 of our rules, however, we believe that operators of these stations may be able to offset or mitigate the effects of this change by relocating or redirecting their antennas, or by making other permitted technical adjustments.

This cavalier dismissal represents the latest in a series of instances in the past few years in which the Commission has made unwarranted and completely incorrect assumptions about the ability of Amateur stations to avoid preclusive interference from an incompatible spectrum use by reorienting or relocating antennas. These assumptions are made without any factual basis at all,

in order to justify an allocation decision the Commission desires to make. To be clear on these points: (A) It is in most cases impossible to "relocate" an antenna array (especially for the 2300-2305 MHz band), as those are typically large, fixed antenna arrays. (B) "Redirecting" a directional antenna is possible in some instances, assuming that the station from which an Amateur station desires to receive signals is not located in or near an azimuth that includes a mobile broadband device, in which case the Amateur communication is precluded. In any case, however, (C) The operation of mobile broadband devices can be anticipated to be ubiquitous, making the "redirecting" of Amateur antennas an exercise in futility.

4. At paragraphs 162-163 of the R&O, the Commission stated:

> In allowing WCS licensees additional technical flexibility to facilitate the operation of mobile services, we must consider potential effects on other spectrum users above and below the WCS bands. Five megahertz below the 2305 MHz lower WCS band edge, in the 2290-2300 MHz band, NASA operates its Deep Space Network (DSN), which is vital for communications supporting space exploration. Additionally, above the 2360 MHz upper WCS band edge, AMT [flight test telemetry] operations are conducted by Federal and non-Federal aviation entities in numerous areas throughout the country, collecting real-time data for the purposes of aircraft and missile flight testing. *Also, in the 2300-2305 MHz band, immediately below the lower WCS band edge, radio amateurs conduct technical investigations using weak-signal operations.* The Commission has also asked whether Medical Body Area Networks (MBANs) should be permitted to operate in the 2300-2305 MHz band.
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> *All of these services operate with highly sensitive receivers and high gain antennas in order to receive very weak signals. Although the weak signals and highly directional antennas could increase instances of interference, these services are also operated by persons with specialized technical expertise, and have different types of geographical deployments, so the interference considerations are somewhat different for these services, compared to those for the much more ubiquitous SDARS, which is used by consumers.* The DSN is located at Goldstone in California's Mojave Desert. AMT receiving antennas are deployed in many areas that often have controlled boundaries, such as Federal and non-Federal facilities and airports. *The number of amateur stations conducting weak signal operations in this band is relatively small, and they are often located in low-noise areas that provide favorable conditions for experimentation. As outlined below, we believe that reasonable rules can be devised to allow WCS mobile operations to commence without causing harmful interference to DSN, AMT, or amateur operations.*
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> (emphasis added)

5. Interference cannot be avoided from an incompatible use in an adjacent band notwithstanding the technical competence of licensed radio Amateurs. The location of Amateur stations operating at 2300-2305 MHz is in residences, typically, where they will be in close proximity to WCS mobile devices. ARRL objects to the Commission's practice of making allocation decisions which place incompatible uses in close proximity to Amateur stations and then place on the Amateur licensees the burden of avoiding the interference. The Commission's footnote 405 cited above indicates that there will be increased noise in the band immediately adjacent to WCS allocations. It infers that it is the obligation of the Amateur Radio Service licensees experiencing the interference to make technical modifications or to simply accept the interference. This is not only poor spectrum management generally, but it is contrary to the Commission's own rules governing assignment of frequencies. Section 2.102(f) of the Commission's Rules states rather clearly that "(t)he stations of a service shall use frequencies so separated from the limits of a band allocated to that service as not to cause harmful interference to allocated services in immediately adjoining frequency bands." Given this, it is clearly the obligation of the WCS mobile facilities providers to avoid interference to Amateur stations operating in the band 2300-2305 MHz. If this is not the case, the Commission should explain why it is not adhering to Section 2.102(f) in this case and justify that departure from its longstanding obligation enunciated thereby. The Commission has in the R&O precisely reversed the obligation created by the rule: If WCS mobile stations, operating in accordance with the OOBE limits applicable, cause harmful interference to an allocated service in an adjoining band it is up to the operator of the victim station to adjust their operation to eliminate the harmful interference. The rule, instead, places the obligation to resolve the harmful interference on the WCS mobile (or fixed) station. The Commission must clarify that it is in fact the obligation of

the WCS licensee to address and resolve instances of interference to Amateur Stations operating in the 2300-2305 MHz band.

6. Notwithstanding the foregoing, it may be that the OOBE limits that have been applicable in the past to WCS operations above 2305 MHz will, if applicable to the entirety of the 2300-2305 MHz band after the R&O, minimize instances of interference from mobile WCS facilities to geographically proximate 2300-2305 MHz Amateur operations going forward. What is unclear, however, is whether the R&O changes the status quo with respect to these OOBE limits. The OOBE limit in the entire 2300-2305 MHz band for all WCS facilities has for years been -43 +10 log P dB. See, 47 C.F.R. §27.53(a)(3). NTIA has supported the continuation of this limit in the entire 2300-2305 MHz band, according to paragraph 165 of the R&O. Indeed, the Commission claims, at Paragraph 3, in the second bullet point in that paragraph, that OOBEs for mobile stations "must be attenuated over a 1 MHz bandwidth below the transmitter power (P) by a factor not less than 43 + 10 log (P) dB on all frequencies below 2305 MHz." WCS base and other base stations supporting mobile and portable stations up to 2 kW average EIRP per 5 megahertz bandwidth must attenuate OOBEs not less than 43 + 10 log (P) dB on all frequencies below 2305 MHz.

7. This OOBE limit will help protect some Amateur operations in the 2300-2305 MHz band from interference from lower-power mobile and portable WCS facilities, given that the attenuation limit for OOBEs is measured over a 1 MHz bandwidth, and given the narrow bandwidth of Amateur receivers typically utilized in the 2300-2305 MHz band. However, this is not necessarily a sufficient means of avoiding interference from WCS mobile facilities to geographically proximate Amateur stations. ARRL calculations show that a typical Amateur station operating in the 2300-2305 MHz band, assuming 23 dBi of antenna gain and a local noise

figure of 3 dB, located 30 meters away from a mobile device complying with the limits, will see a 51 dB increase in noise from OOBEs at the limit to the Amateur station in the main beam of the Amateur antenna. Typical antennas for Amateur use in this band have sidelobes at -20dB. In this case, there would still be an increase of noise 31 dB from a single nearby mobile WCS emitter. The premise that an Amateur Radio station can control interference by antenna azimuth changes is obviously incorrect in this environment. It is also apparent that the present OOBE limit for WCS facilities is not going to be adequate in many cases to avoid harmful interference to Amateur Radio stations operating between 2300 and 2305 MHz.

8. Even if it is assumed that the OOBE limit of 43 + 10 log (P) dB will be adequate to minimize interference generally, the rules adopted in the R&O do not clearly require that this OOBE limit be achieved over the entire 2300-2305 MHz band. The text of the modified rules adopted in the R&O, at §§27.53(a)(1)(ii), 27.53(a)(2)(ii), 27.53(a)(3)(ii) and 27.53(a)(4)(ii) establish an OOBE limit only at the discrete frequency 2305 MHz (with a higher limit applicable below 2300 MHz). When contrasted with the band-inclusive language of the current rule and the text of the R&O (and as well the position of NTIA in this matter, to which the WCS coalition agreed) the rules in the R&O are unclear with respect to the OOBE obligation of mobile broadband WCS licensees. Because the Commission is in substantial error in its dismissive assumptions as to the ability of an Amateur station to mitigate interference from a mobile or portable WCS station in close geographic proximity to the Amateur antenna, it is critical to establish a firm, workable OOBE limit for these facilities at the outset, as the only means of protecting regular, ongoing Amateur Radio communications in this band. It is necessary, therefore, for the Commission to clarify now, preferably by revising the adopted rule sections 27.53(a)(1)(ii), 27.53(a)(2)(ii), 27.53(a)(3)(ii) and 27.53(a)(4)(ii), that the cited rule sections do

in fact require that OOBEs for mobile stations "must be attenuated over a 1 MHz bandwidth below the transmitter power (P) by a factor not less than 43 + 10 log (P) dB *on all frequencies between 2300 and 2305 MHz."* It is also important to place the burden of harmful interference resolution where it properly belongs, and where Section 2.102(f) places it: on the WCS licensee and not on the victim Amateur Radio Service licensee operating in the 2300-2305 MHz band.

Therefore, for all of the above reasons, ARRL, the national association for Amateur Radio, respectfully requests that the Commission issue the requested clarifications and/or reconsider the rules adopted in the R&O in accordance with the foregoing.

Respectfully submitted,

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